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MATTERS ARISING FROM THE UNITED NATIONS CONFERENCE ON ENVIRONMENT AND DEVELOPMENT IN THE FIELD OF WATER RESOURCES

Provisions of Agenda 21 relevant to the area of freshwater resources

Report of the Secretary-General

SUMMARY

The effective implementation of the provisions of Agenda 21 will be one of the most important tasks facing the United Nations system in the years to come. The main objectives, recommendations, proposed activities and targets adopted by the United Nations Conference on Environment and Development, held in Rio de Janeiro from 3 to 14 June 1992, provide the basic guidelines for the integration of action by the United Nations system with regard to environment and development, and with a view to achieving the ultimate goal of sustainable development.

In this context, the challenge of securing a reliable supply of freshwater, adequate in quantity and quality, for all people, is perhaps the most fundamental issue related to both environment and development. However, although one of the forty chapters of Agenda 21 deals with the protection of the quality and supply of freshwater resources, the vital issue of freshwater resources, unlike that of biological conservation, of climate change and of forest conservation, was not fully addressed by the Conference.

Water is a basic and essential component of life on this planet. The availability and quality of freshwater are of critical importance for both natural and human environments. Scarcity and misuse of freshwater pose a

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serious and growing threat to sustainable development and protection of the environment. The factors of human health, welfare, food security, industrial development, economic prosperity of human settlements and geopolitical stability, and the ecosystem on which those factors depend, are all at risk, unless water and land resources are managed, in the present decade and beyond, more effectively than they have been in the past.

As there is hardly any current issue that demonstrates more conclusively than freshwater resources the integrated nature of environment and development, the present report summarizes, by means of tables, the provisions of various chapters of Agenda 21 that are relevant to the area of freshwater resources, in order to provide a convenient reference list of those provisions in relation to the various programme areas.

CONTENTS

	Paragraphs	Page
INTRODUCTION	1 - 2	4
I. SUMMARY OF RELEVANT PROVISIONS OF AGENDA 21	3 - 23	4
A. Main objectives	3 - 8	4
B. Proposed activities	9 - 16	12
C. Targets and financing	17 - 23	19

INTRODUCTION

1. The present summary of the provisions of Agenda 21 1/ that are relevant to the area of water resources is divided into three parts: main objectives, proposed activities, and targets and financing. Instead of merely reproducing the innumerable water-related references of Agenda 21, it attempts to identify the main objectives, activities and targets specified in different programme areas of chapter 18, as well as the proposed water-related activities presented in other chapters, with a view to highlighting the areas of implementation that are common to different programme areas and call for interprogramme cooperation and collaboration.

2. Although the summary is based primarily upon chapter 18 of Agenda 21, entitled "Protection of the quality and supply of freshwater resources: application of integrated approaches to the development, management and use of water resources", it also draws upon complementary information from other chapters that are related to the subject of water resources, particularly those on protecting and promoting human health (chapter 6), promoting sustainable human settlement development (chapter 7), managing fragile ecosystems: combating desertification and drought (chapter 12), protection of the oceans, all kinds of seas and coastal areas (chapter 17) and environmentally sound management of solid wastes and sewage-related issues (chapter 21).

I. SUMMARY OF RELEVANT PROVISIONS OF AGENDA 21

A. Main objectives

3. Table 1 shows that there are five main objectives set forth in the introduction to chapter 18 of Agenda 21: (a) protection of water quality, (b) promotion of innovative technologies, (c) integrated water resources planning and management, (d) rational utilization of water resources and (e) promotion of international cooperation with regard to transboundary water resources.

4. As indicated in table 2, the six main objectives set forth in programme area A (Integrated water resources development and management) of chapter 18 of Agenda 21 are (a) promotion of integrated water resources management, (b) strengthening of interaction between national and local levels of water resources planning and management, (c) support for public participation in water resources planning and management, (d) capacity-building, (e) promotion of basic needs and cost recovery, and (f) promotion of international cooperation with regard to transboundary water resources.

5. As shown in table 3, it is possible to identify nine main objectives set forth in complementary programme areas B and G (Water resources assessment and Impacts of climate change on water resources, respectively) of chapter 18 of Agenda 21: (a) promotion of quantity and quality water resources assessments,

Table 1. Main objectives set forth in the introduction to chapter 18 of Agenda 21

Objective	Relevant citation
Protection of water quality	"The general objective is to make certain that adequate supplies of water of good quality are maintained for the entire population of this planet, while preserving the hydrological, biological and chemical functions of ecosystems, adapting human activities within the capacity limits of nature and combating vectors of water-related diseases" (para. 18.2)
Promotion of innovative technologies	"Innovative technologies, including the improvement of indigenous technologies, are needed to fully utilize limited water resources and to safeguard those resources against pollution" (para. 18.2)
Integrated water resources planning and management	"The widespread scarcity, gradual destruction and aggravated pollution of freshwater resources in many world regions, along with the progressive encroachment of incompatible activities, demand integrated water resources planning and management. Such integration must cover all types of interrelated freshwater bodies, including both surface water and groundwater, and duly consider water quantity and quality aspects. The multisectoral nature of water resources development in the context of socio-economic development must be recognized, as well as the multi-interest utilization of water resources for water-supply and sanitation, agriculture, industry, urban development, hydropower generation, inland fisheries, transportation, recreation, low and flat lands management and other activities" (para. 18.3)
Rational utilization of water resources	"Rational water utilization schemes for the development of surface and underground water-supply sources and other potential sources have to be supported by concurrent water conservation and wastage minimization measures" (para. 18.3)
International cooperation with regard to transboundary water resources	"Transboundary water resources and their use are of great importance to riparian States. In this connection, cooperation among those States may be desirable in conformity with existing agreements and/or other relevant arrangements, taking into account the interests of all riparian States concerned" (para. 18.4)

Table 2. Main objectives set forth under programme area A of Chapter 18 of Agenda 21

Objective	Relevant citation
Integrated water resources management	"Promote a dynamic, interactive, iterative and multisectoral approach to water resources management, including the identification and protection of potential sources of freshwater supply, that integrates technological, socio-economic, environmental and human health considerations" (para. 18.9 (a))
Interaction of national with local levels	"To plan for the sustainable and rational utilization, protection, conservation and management of water resources based on community needs and priorities within the framework of national economic development policy" (para. 18.9 (b))
Public participation in water management	"To design, implement and evaluate projects and programmes that are both economically efficient and socially appropriate within clearly defined strategies, based on an approach of full public participation, including that of women, youth, indigenous people and local communities in water management policy-making and decision-making" (para. 18.9 (c))
Capacity-building	"To identify and strengthen or develop, as required, in particular in developing countries, the appropriate institutional, legal and financial mechanisms to ensure that water policy and its implementation are a catalyst for sustainable social progress and economic growth" (para. 18.9 (d))
Promotion of basic needs and cost recovery	"In developing and using water resources, priority has to be given to the satisfaction of basic needs and the safeguarding of ecosystems. Beyond these requirements, however, water users should be charged appropriately" (para. 18.8)
International cooperation with regard to transboundary water resources	"In the case of transboundary water resources, there is a need for riparian States to formulate water resources strategies, prepare water resources action programmes and consider, where appropriate, the harmonization of those strategies and action programmes" (para. 18.10)

Table 3. Main objectives set forth under complementary programme areas B and G of chapter 18 of Agenda 21

Objective	Relevant citation
Promotion of overall assessment of quantity and quality of water resources	"Ensuring the assessment and forecasting of the quantity and quality of water resources, in order to estimate the total quantity of water resources available and their future supply potential, to determine their current quality status, to predict possible conflicts between supply and demand and to provide a scientific database for rational water resources utilization" (para. 18.24)
Dissemination of water resources assessment technology	"To make available to all countries water resources assessment technology that is appropriate to their needs, irrespective of their level of development, including methods for the impact assessment of climate change on freshwaters" (para. 18.25 (a))
Adequate allocation of funds to water resources assessment	"To have all countries, according to their financial means, allocate to water resources assessment financial resources in line with the economic and social needs for water resources data" (para. 18.25 (b))
Full use of water resources assessment data in water policy	"To ensure that the assessment information is fully utilized in the development of water management policies" (para. 18.25 (c))
International cooperation with regard to transboundary water resources	"To have all countries establish the institutional arrangements needed to ensure the efficient collection, processing, storage, retrieval and dissemination to users of information about the quality and quantity of available water resources at the level of catchments and groundwater aquifers in an integrated manner" (para. 18.25 (d))
Human resources development	"To have sufficient numbers of appropriately qualified and capable staff recruited and retained by water resources assessment agencies and provided with the training and retraining they will need to carry out their responsibilities successfully" (para. 18.25 (e))
Assessment of potential impact of climate change	"To understand and quantify the threat of the impact of climate change on freshwater resources" (para. 18.84 (a))
Implementation of countermeasures to offset impacts of climate change	"To facilitate the implementation of effective national countermeasures, as and when the threatening impact is seen as sufficiently confirmed to justify such action" (para. 18.84 (b))
Study of climate change, droughts and floods	"To study the potential impacts of climate change on areas prone to droughts and floods" (para. 18.84 (c))

(b) dissemination of water resources assessment technology, (c) provision of adequate funds for water resources assessments, (d) full utilization of water resources assessment data in water development planning and policy, (e) promotion of international cooperation with regard to transboundary water resources, (f) human resources development, (g) incentive to assessments of potential impacts of climate change on freshwater resources, (h) implementation of countermeasures to offset, and (i) support for studies on, those impacts.

6. Table 4 demonstrates that there are eight main objectives set forth in programme area C (Protection of water resources, water quality and aquatic ecosystems) of chapter 18 of Agenda 21: (a) promotion of integrated water resources management, (b) identification and protection of potential sources of freshwater supply, (c) protection of groundwater, (d) promotion of water pollution prevention and control, (e) protection of aquatic ecosystems, (f) control of water-borne diseases, (g) human resources development, and (h) strengthening of international monitoring systems.

7. As shown in table 5, it is possible to identify eight main objectives set forth in complementary programme areas D and E (Drinking-water supply and sanitation and Water and sustainable urban development, respectively) of chapter 18 of Agenda 21: (a) protection of health and the environment, (b) promotion of institutional reform within an integrated approach to water resources development and management, (c) promotion of community management, (d) promotion of appropriate technologies, (e) integration of urban water-supply with national development policy, (f) extension of urban drinking-water supply and sanitation, (g) establishment of urban discharge standards, and (h) improvement in the collection, recycling and disposal of solid waste.

8. As table 6 indicates, it is possible to identify nine main objeccives set forth in complementary programme areas D and F (Drinking-water supply and sanitation and Water for sustainable food production and rural development, respectively) of chapter 18 of Agenda 21: (a) protection of health and the environment, (b) promotion of institutional reform within an integrated approach to water resources development and management, (c) promotion of community management, (d) promotion of appropriate technologies, (e) recognition of the economic and social value of water resources, (f) promotion of rational water use and environmental impact assessments, (g) promotion of integrated water resources management, (h) extension of rural drinking-water supply and sanitation, and (i) sustainable management of inland fisheries and livestock.

Table 4. Main objectives set forth under programme area C of chapter 18 of Agenda 21

Objective	Relevant citation
Integrated water resources management	"Long-term development of global freshwater requires holistic management of resources and a recognition of the interconnectedness of the elements related to freshwater and freshwater quality" including "the intrinsic linkage between water resource development projects and their significant physical, chemical, biological, health and socio-economic repercussions". Similarly, "erosion, sedimentation, deforestation and desertification have led to increased land degradation, and the creation of reservoirs has, in some cases, resulted in adverse effects on ecosystems" (paras. 18.35 and 18.36)
Identification and protection of potential sources of freshwater supply	"To identify all potential sources of water-supply and prepared outlines for their protection, conservation and rational use" (para. 18.39 (b))
Protection of groundwater	"The extent and severity of contamination of unsaturated zones and aquifers have long been underestimated owing to the relative inaccessibility of aquifers and the lack of reliable information on aquifer systems. The protection of groundwater is therefore an essential element of water resource management" (para. 18.37)
Water pollution prevention and control	"To initiate effective water pollution prevention and control programmes, based on an appropriate mixture of pollution reduction-at-source strategies, environmental impact assessments and enforceable standards for major point-source discharges and high-risk non-point sources, commensurate with their socio-economic development" (para. 18.39 (c))
Protection of aquatic ecosystems	"Maintenance of ecosystem integrity, according to a management principle of preserving aquatic ecosystems, including living resources, and of effectively protecting them from any form of degradation on a drainage basin basis" (para. 18.38 (a))
Control of water-borne diseases	"Public health protection, a task requiring not only the provision of safe drinking-water but also the control of disease vectors in the aquatic environment" (para. 18.38 (b))
Human resources development	"Human resources development, a key to capacity-building and a prerequisite for implementing water-quality management" (para. 18.38 (c))
Promotion of international monitoring systems	"To participate, as far as appropriate, in international water-quality monitoring and management programmes such as the Global Water Quality Monitoring Programme (GEMS/WATER), the United Nations Environment Programme (UNEP) Environmentally Sound Management of Inland Waters (EMINWA), the FAO regional inland fishery bodies, and the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention)" (para. 18.39 (d))

Table 5. Main objectives set forth under complementary programme areas D and E of chapter 18 of Agenda 21

Objective	Relevant citation
Protection of health and the environment	"Protection of the environment and safeguarding of health through the integrated management of water resources and liquid and solid wastes" (para. 18.48 (a))
Institutional reform and integrated development	"Institutional reforms promoting an integrated approach and including changes in procedures, attitudes and behaviour" (para. 18.48 (b))
Community management	"Community management of services, backed by measures to strengthen local institutions in implementing and sustaining water and sanitation programmes" and "the full participation of women at all levels in sector institutions" (para. 18.48 (b) and (c))
Promotion of efficient management and appropriate technologies	"Sound financial practices, achieved through better management of existing assets, and widespread use of appropriate technologies" (para. 18.48 (d))
Promotion of national development and urban water-supply	"Support local and central Governments' efforts and capacities to sustain national development and productivity through environmentally sound management of water resources for urban use" (para. 18.57)
Greater provision of urban water-supply and sanitation	"To have ensured that all urban residents have access to at least 40 litres per capita per day of safe water and that 75 per cent of the urban population are provided with on-site or community facilities for sanitation" (para. 18.58 (a))
Establishment of discharge standards for municipal and industrial effluents	"To have established and applied quantitative and qualitative discharge standards for municipal and industrial effluents" (para. 18.58 (b))
Better collection, recycling and disposal of solid waste	"To have ensured that 75 per cent of solid waste generated in urban areas are collected and recycled or disposed of in an environmentally safe way" (para. 18.58 (c))

Table 6. Main objectives set forth under complementary programme areas D and F of chapter 18 of Agenda 21

Objective	Relevant citation
Protection of health and the environment	"Protection of the environment and safeguarding of health through the integrated management of water resources and liquid and solid wastes" (para. 18.48 (a))
Institutional reform and integrated development	"Institutional reforms promoting an integrated approach and including changes in procedures, attitudes and behaviour" (para. 18.48 (b))
Community management	"Local communities must participate in all phases of water management, ensuring the full involvement of women in view of their crucial role in the practical day-to-day supply, management and use of water" (para. 18.68 (b))
Promotion of efficient management and appropriate technologies	"Sound financial practices, achieved through better management of existing assets, and widespread use of appropriate technologies" (para. 18.48 (d))
Recognition of economic and social value of water	"Water should be regarded as a finite resource having an economic value with significant social and economic implications reflecting the importance of meeting basic needs" (para. 18.68 (a))
Promotion of rational use and environmental impact assessment	"New irrigation schemes should be accompanied by an environmental impact assessment, depending upon the scale of the scheme, in case significant negative environmental impacts are expected. When considering proposals for new irrigation schemes, consideration should also be given to a more rational exploitation, and an increase in the efficiency or productivity, of any existing schemes capable of serving the same localities" (para. 18.72)
Integrated water resources management	"Water resource management must be developed within a comprehensive set of policies for (i) human health; (ii) food production, preservation and distribution; (iii) disaster mitigation plans; (iv) environmental protection and conservation of the natural resource base" (para. 18.68 (c))
Greater provision of rural water-supply and sanitation	"It should be ensured that rural communities of all countries, according to their capacities and available resources and taking advantage of international cooperation as appropriate, will have access to safe water in sufficient quantities and adequate sanitation to meet their health needs and maintain the essential qualities of their local environments" (para. 18.73)
Sustainable management of inland fisheries and livestock	"The objectives with regard to water management for inland fisheries and aquaculture include conservation of water-quality and water-quantity requirements for optimum production and prevention of water pollution by aquacultural activities" and "the promotion of sustainable management of capture fisheries as well as the development of environmentally sound approaches to intensification of aquaculture". "The objectives with regard to water management for livestock supply are twofold: provision of adequate amounts of drinking-water and safeguarding of drinking-water quality in accordance with the specific needs of different animal species" (paras. 18.74 and 18.75)

B. Proposed activities

9. The 184 proposed activities specified in the seven programme areas of chapter 18 of Agenda 21 can be classified within 30 broad groups. As table 7 shows, most of those broad groups encompass four or more programme areas, and are thus open to interprogrammatic coordination. As table 8 also shows, mention of many of these broad groups of activities can be found in other chapters of Agenda 21.

10. The proposed activities put forward in programme area A (Integrated water resources development and management) of chapter 18 of Agenda 21 can be classified within the following broad groups: (a) promotion of inventory of freshwater resources, (b) protection of potential sources of freshwater supply, (c) development of new sources of water-supply, (d) promotion of research and development, (e) promotion of application and transfer of technology, (f) strengthening of the role of modern information management, (g) promotion of data dissemination and public information, (h) integration of surface and underground water management, (i) integration of land and water uses, (j) integration of water quantity and quality management, (k) promotion of optimum allocation and efficient use of water, (l) promotion of environmental impact assessments, (m) strengthening of drought prevention and management, (n) strengthening of flood prevention and management, (o) promotion of environmentally and socially benign hydropower, (p) promotion of private sector involvement, (q) promotion of public participation in development and management, (r) human resources development, (s) strengthening of institutional and legal mechanisms, (t) promotion of monitoring, evaluation and assessment of progress in implementation, (u) strengthening of local water resources management, (v) strengthening of national water resources management, (w) strengthening of water resources management at the basin (national or international) level, and (x) promotion of global coordination and international cooperation.

11. The proposed activities put forward in programme area B (Water resources assessment) of chapter 18 of Agenda 21 can be classified within the following broad groups: (a) promotion of inventories of freshwater resources, (b) promotion of research and development, (c) promotion of application and transfer of technology, (d) strengthening of the role of modern information management, (e) promotion of data dissemination and public information, (f) integration of surface and underground water management, (g) integration of land and water uses, (h) integration of water quantity and quality management, (i) protection of aquatic ecosystems, (j) promotion of environmental impact assessments, (k) strengthening of drought prevention and management, (l) strengthening of flood prevention and management, (m) promotion of public participation in development and management, (n) human resources development, (o) strengthening of institutional and legal mechanisms, (p) strengthening of local water resources management, (q) strengthening of national water resources management, (r) strengthening of water resources management at the basin (national or international) level, and (s) promotion of global coordination and international cooperation.

Table 7. Main proposed activities set forth under programme areas of chapter 18 of Agenda 21
(Relevant paragraph)

Broad group of proposed activities	Programme area						
	A	B	C	D	E	F	G
Promotion of inventory of water resources	18.12 (b)	18.24 18.27 (a) (iv) 18.30	18.40 (a) (ii)			18.78	
Protection of potential sources of water-supply	18.12 (b)		18.40 (a)	18.50 (a) (i)	18.59 (a)	18.76 (g) (iii)	18.85 (e)
Development of new sources of water-supply	18.12 (j) 18.14		18.40 (b) (iv) 18.40 (b) (viii)	18.50 (a) (iii) 18.50 (a) (v) 18.50 (b) (viii)	18.59 (a) (iii)		
Promotion of research and development	18.12 (i) 18.14	18.27 (d) 18.29	18.40 (c) 18.43 18.44	18.50 (c) (x)	18.59 (a) (vi) 18.61	18.76 (b) (ii) 18.78	18.85 18.87 18.88
Application and transfer of technology	18.12 (i) 18.14 18.20 (f)	18.25 (a) 18.30	18.42 18.43		18.61	18.79 18.81 (f)	
Strengthening of information management	18.12 (c) 18.14 18.20 (f)	18.25 (d) 18.27 (b)	18.40 (g) (ii) 18.44	18.50 (d) (i) 18.50 (d) (ii)		18.76 (h) (v)	
Data dissemination and public information	18.12 (g) 18.12 (p) 18.20 (a)	18.27 (c)		18.50 (b) (v) 18.50 (d) (ii)	18.59 (d) 18.61	18.76 (a) (vii) 18.76 (d) (vii) 18.78	
Integration of surface and ground water management	18.12 (k)	18.27 (b) (ii)	18.40 (d) (iii) 18.40 (d) (iv)			18.76 (c) (iii)	18.85 (e)
Integration of land and water uses	18.9	18.27 (b) (ii)	18.40 (d) (i) 18.40 (e) (ii) 18.40 (g) (v)		18.59 (a) (v) 18.59 (c) (ii)	18.76 (d) (ii) 18.76 (g)	18.84 (b)
Integration of water-quantity and -quality management	18.12 (k)	18.27 (b) (ii)	18.38 (b)	18.50 (a) (v)		18.76 (d) (iii) 18.76 (h) (v)	
Promotion of optimum allocation and efficient use of water	18.12 (d) 18.12 (e) 18.12 (l)		18.39 (a) 18.40 (b) (i)	18.50 (b) (vi) 18.50 (c) (viii) 18.50 (c) (xi)	18.59 (b) 18.59 (d) (i) 18.59 (f) (iii)	18.72 18.76 (a) (iii) 18.76 (b) (i)	

Table 7 (continued)

Broad group of proposed activities	Programme area						
	A	B	C	D	E	F	G
Improvement of drinking-water supply and sanitation			18.38 (b) 18.40 (b) (ii) 18.40 (c) (ii)	18.47 18.50 (a)	18.59 (a) (i) 18.59 (b) (ii) 18.59 (f)	18.76 (a) 18.76 (d) (v)	
Control of industrial discharges			18.40 (b) 18.40 (c)	18.50 (a) (v)	18.59 (a) (iv)		
Promotion of sustainable agriculture			18.40 (b) (vii) 18.40 (c) (iii) 18.40 (g) (iv)		18.59 (a) (vii)	18.76 (b) 18.76 (d) 18.76 (e)	
Protection of aquatic ecosystems		18.29	18.40 (b) (v) 18.40 (e) 18.40 (f)		18.56	18.76 (d) (iii) 18.76 (h) (iii)	
Control of water-borne diseases			18.38 (b) 18.39 (e)	18.50 (a) (vi)		18.76 (a) (vii) 18.76 (a) (ix) 18.76 (g) (iii)	
Promotion of environmental impact assessments	18.12 (c) 18.12 (f)	18.25 (a)	18.40 (b) (v) 18.40 (g) (ii) 18.40 (h) (iv)			18.72 18.76 (i) (iii)	18.85 (d)
Drought prevention and management	18.12 (f) 18.12 (h)	18.27 (a) (ii) 18.27 (b) (i) 18.27 (c) (iii)				18.76 (c) (iv) 18.76 (f) (i) 18.76 (f) (iii)	18.84 (c) 18.85 (c)
Flood prevention and management	18.12 (f)	18.27 (a) (ii) 18.27 (b) (i) 18.27 (c) (iii)			18.59 (a) (iii)	18.76 (c) (i) 18.76 (c) (ii) 18.76 (d) (iv)	18.84 (c) 18.85 (c) 18.88
Control of saline intrusion			18.40 (d) (ii)		18.56	18.76 (c)	18.82 18.85 (e)
Environmentally sustainable hydropower	18.18					18.76 (e) (vi)	
Enhancement of private sector involvement	18.18					18.81 (e)	
Promotion of public participation in water management	18.9 (c) 18.12 (n) 18.19	18.34 (d)		18.50 (b) (iii) 18.50 (c) (ii) 18.54	18.59 (c) (iii) 18.59 (f) (iv) 18.62	18.68 (d) 18.72	
Human resources development	18.19 18.20	18.31 18.32 18.33	18.38 (c) 18.45 18.46	18.50 (b) (iv) 18.53	18.59 (f) (iv) 18.62	18.79 18.80 18.81 (e)	18.89

/...

Table 7 (continued)

Broad group of proposed activities	Programme area						
	A	B	C	D	E	F	G
Strengthening of institutional and legal mechanisms	18.12 (o)(ii) 18.21 18.22	18.25 (d) 18.27 (a)(ii) 18.34 (a)	18.40 (a)(i) 18.40 (a)(v) 18.47	18.55	18.59 (c) 18.59 (e)(i) 18.63	18.76 (a)(vi) 18.81	18.90
Monitoring and assessment of implementation	18.22		18.40 (g) 18.40 (h)(i) 18.44	18.50 (d)(i) 18.50 (d)(ii)		18.76 (a)(v) 18.76 (b)(iii) 18.76 (d)(i)	
Strengthening of local water resources management	18.12 (m) 18.12 (o)(i) 18.22	18.34 (d)		18.50 (b) 18.50 (c) 18.54	18.59 (c) 18.59 (f)(i) 18.59 (f)(v)	18.76 (a)(iv) 18.76 (b)(iv) 18.76 (e)	
Strengthening of national water resources management	18.12 (a) 18.12 (o)(ii) 18.22	18.25 (b) 18.27 (a)(i) 18.27 (a)(iii)	18.40 (a)(iii) 18.42 18.43	18.50 (b)(i) 18.50 (c)(iii) 18.50 (c)(iv)	18.59 (e)(ii) 18.64	18.76 (a)(i) 18.76 (a)(vi) 18.76 (h)(i)	18.90
Strengthening of water basin resources management	18.9 18.10 18.12 (o)(iii)	18.27 (a)(iv)	18.36 18.40 (h)(i) 18.40 (h)(iii)				
Global coordination and international cooperation	18.12 (i) 18.12 (o)(iv) 18.22	18.29	18.39 (d) 18.42 18.43	18.50 (b)(vi) 18.50 (d)(iii) 18.55	18.61 18.64		18.85 (g) 18.87 18.88

Table 8. Proposed water-related activities set forth in other chapters of Agenda 21
(Relevant paragraph)

Broad group of proposed activities	Chapter 6	Chapter 7	Chapter 12	Chapter 13	Chapter 17	Chapter 21	Chapter 40
Promotion of inventory of water resources			12.12 (a)	13.5 (a)			40.8
Protection of potential sources of water-supply							
Development of new sources of water-supply							
Promotion of research and development	6.41 (c)(i)	7.39		13.10 13.21 (b)		21.35 (b)	40.8
Application and transfer of technology		7.39	12.12 (c)	13.21 (b) 13.21 (c)			40.8
Strengthening of information management			12.6 12.7 12.9				40.8 40.13
Data dissemination and public information	6.16 6.34 (a)(iii)	7.45 (a)	12.14 (b)	13.18 (b) 13.22 (a)		21.42 (a)	40.8 40.13
Integration of surface- and groundwater management							
Integration of land and water uses				13.14 13.15 (a)	17.6 (a)		
Integration of water-quantity and -quality management	6.33						
Promotion of optimum allocation and efficient use of water		7.16 (c)(i)					
Improvement of drinking-water supply and sanitation	6.5 (a)(i) 6.33 6.41 (c)(ii)	7.5 (d) 7.39 7.40			17.6 (f) 17.27 17.28 (j)	21.42 21.45 (c) 21.46	
Control of industrial discharges	6.41 (c)(ii)				17.28	21.35 21.39 21.40 (b)	
Promotion of sustainable agriculture	6.41 (d)				17.28 (h) 17.28 (i) 17.28 (j)		
Protection of aquatic ecosystems							

Table 8 (continued)

Broad group of proposed activities	Chapter 6	Chapter 7	Chapter 12	Chapter 13	Chapter 17	Chapter 21	Chapter 40
Control of water-borne diseases	6.10 6.12 6.13 (d)	7.35				21.29 (b) 21.39	
Promotion of environmental impact assessments	6.34 (c)(i) 6.40 (d)	7.41 (b)	12.12 (b)				
Drought prevention and management			12.46 12.47 12.48				
Flood prevention and management				13.7 (c) 13.18 (b)			
Control of saline intrusion					17.6 (e) 17.100 (c)		
Environmentally sustainable hydropower				13.24			
Enhancement of private sector involvement		7.45 (c)		13.18 (c) 13.24			
Promotion of public participation in water management		7.45 (c)	12.14 (b) 12.56 12.57	13.14 13.21 (b)			
Human resources development	6.16	7.45 (b)	12.13	13.22 (a)		21.25 (b)	
Strengthening of institutional and legal mechanisms	6.41 (c)(ii)	7.45 (d)	12.14 (a) 12.36 12.37				
Monitoring and assessment of implementation		7.39	12.9 12.10 12.12 (b)	13.7 (a)		21.11	40.8 40.13
Strengthening of local water resources management		7.45 (c)	12.10 (c)			21.29 (b)	
Strengthening of national water resources management							40.8
Strengthening of water basin resources management			12.10 (a) 12.10 (b)	13.18 (b)			
Global coordination and international cooperation			12.10 (a) 12.10 (b)			21.42 (a)	40.8 40.13

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12. The proposed activities put forward in programme area C (Protection of water resources, water quality and aquatic ecosystems) of chapter 18 of Agenda 21 can be classified within the following broad groups: (a) promotion of inventories of freshwater resources, (b) protection of potential sources of freshwater supply, (c) development of new sources of water-supply, (d) promotion of research and development, (e) promotion of application and transfer of technology, (f) strengthening of the role of modern information management, (g) integration of surface and underground water management, (h) integration of land and water uses, (i) integration of water quantity and quality management, (j) promotion of optimum allocation and efficient use of water, (k) expansion of drinking-water supply and sanitation, (l) control of industrial discharges, (m) promotion of sustainable agriculture, (n) protection of aquatic ecosystems, (o) control of water-borne diseases, (p) promotion of environmental impact assessments, (q) strengthening of drought prevention and management, (r) strengthening of flood prevention and management, (s) control of saline intrusion, (t) human resources development, (u) strengthening of institutional and legal mechanisms, (v) promotion of monitoring, evaluation and assessment of progress in implementation, (w) strengthening of national water resources management, (x) strengthening of water resources management at the basin (national or international) level, and (y) promotion of global coordination and international cooperation.

13. The proposed activities put forward in programme area D (Drinking-water supply and sanitation) of chapter 18 of Agenda 21 can be classified within the following broad groups: (a) protection of potential sources of freshwater supply, (b) development of new sources of water-supply, (c) promotion of research and development, (d) strengthening of the role of modern information management, (e) promotion of data dissemination and public information, (f) integration of water quantity and quality management, (g) promotion of optimum allocation and efficient use of water, (h) expansion of drinking-water supply and sanitation, (i) control of industrial discharges, (j) control of water-borne diseases, (k) promotion of public participation in development and management, (l) human resources development, (m) strengthening of institutional and legal mechanisms, (n) promotion of monitoring, evaluation and assessment of progress in implementation, (o) strengthening of local water resources management, (p) strengthening of national water resources management, and (q) promotion of global coordination and international cooperation.

14. The proposed activities put forward in programme area E (Water and sustainable urban development) of chapter 18 of Agenda 21 can be classified within the following broad groups: (a) protection of potential sources of freshwater supply, (b) development of new sources of water-supply, (c) promotion of research and development, (d) promotion of application and transfer of technology, (e) promotion of data dissemination and public information, (f) integration of land and water uses, (g) promotion of optimum allocation and efficient use of water, (h) expansion of drinking-water supply and sanitation, (i) control of industrial discharges, (j) promotion of sustainable agriculture, (k) protection of aquatic ecosystems, (l) promotion of environmental impact assessments, (m) strengthening of flood prevention and management, (n) control of saline intrusion, (o) promotion of public participation in development and management, (p) human resources development, (q) strengthening of institutional

and legal mechanisms, (r) strengthening of local water resources management, (s) strengthening of national water resources management, and (t) promotion of global coordination and international cooperation.

15. The proposed activities put forward in programme area F (Water for sustainable food production and rural development) of chapter 18 of Agenda 21 can be classified within the following broad groups: (a) promotion of inventories of freshwater resources, (b) protection of potential sources of freshwater supply, (c) promotion of research and development, (d) promotion of application and transfer of technology, (e) strengthening of the role of modern information management, (f) promotion of data dissemination and public information, (g) integration of surface and underground water management, (h) integration of land and water uses, (i) integration of water quantity and quality management, (j) promotion of optimum allocation and efficient use of water, (k) expansion of drinking-water supply and sanitation, (l) promotion of sustainable agriculture, (m) protection of aquatic ecosystems, (n) control of water-borne diseases, (o) promotion of environmental impact assessments, (p) strengthening of drought prevention and management, (q) strengthening of flood prevention and management, (r) control of saline intrusion, (s) promotion of environmentally and socially benign hydropower, (t) promotion of private sector involvement, (u) promotion of public participation in development and management, (v) human resources development, (w) strengthening of institutional and legal mechanisms, (x) promotion of monitoring, evaluation and assessment of progress in implementation, (y) strengthening of local water resources management, and (z) strengthening of national water resources management.

16. The proposed activities put forward in programme area G (Impact of climate change on water resources) of chapter 18 of Agenda 21 can be classified within the following broad groups: (a) protection of potential sources of freshwater supply, (b) promotion of research and development, (c) integration of surface and underground water management, (d) integration of land and water uses, (e) promotion of environmental impact assessments, (f) strengthening of drought prevention and management, (g) strengthening of flood prevention and management, (h) control of saline intrusion, (i) human resources development, (j) strengthening of institutional and legal mechanisms, (k) strengthening of national water resources management, and (l) promotion of global coordination and international cooperation.

C. Targets and financing

17. The United Nations Conference on Environment and Development secretariat has estimated the average total annual cost (1993-2000) of implementing all the activities listed in chapter 18 of Agenda 21 to be about US$ 54,770 million, of which US$ 17,040 million is expected to be provided by the international community on grant or concessional terms. A breakdown of this estimated total annual expenditure, according to the seven programme areas presented in chapter 18, is provided in table 9.

Table 9. Programme area targets and financing and cost evaluation of programme activities as set forth in chapter 18 of Agenda 21

Programme area	Programme area target by the year 2000	Financial target for the period 1993-2000
Integrated water resources development and management	"To have designed and initiated costed and targeted national action programmes, and to have put in place appropriate institutional structures and legal instruments; to have established efficient water-use programmes to attain sustainable resource utilization patterns" (para. 18.11 (a))	"The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about $115 million from the international community on grant or concessional terms" (para. 18.13)
Water resources assessment	"To have studied in detail the feasibility of installing water resources assessment services" (para. 18.26 (a))	"The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about $355 million, including about $145 million from the international community on grant or concessional terms" (para. 18.28)
Protection of water resources, water quality and aquatic ecosystems	"To reduce the prevalence of water-associated diseases, starting with the eradication of dracunculiasis (guinea worm disease) and onchocerciasis (river blindness)" (para. 18.39 (e))	"The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about $1 billion, including about $340 million from the international community on grant or concessional terms" (para. 18.41)
Drinking-water supply and sanitation	"At the World Summit for Children, in September 1990, heads of State or Government called for both universal access to water-supply and sanitation and the eradication of guinea worm disease by 1995. Even for the more realistic target of achieving full coverage in water-supply by 2025, it is estimated that annual investments must reach double the current levels" (para. 18.49)	"The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about $20 billion, including about $7.4 billion from the international community on grant or concessional terms" (para. 18.51)
Water and sustainable urban development	"To have ensured that all urban residents have access to at least 40 litres per capita per day of safe water and that 75 per cent of the urban population are provided with on-site or community facilities for sanitation; to have established and applied quantitative and qualitative discharge standards for municipal and industrial effluents; to have ensured that 75 per cent of solid waste generated in urban areas are collected and recycled or disposed of in an environmentally safe way" (para. 18.58 (a), (b) and (c))	"The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about $20 billion, including about $4.5 billion from the international community on grant or concessional terms" (para. 18.60)
Water for sustainable food production and rural development	"FAO global projections for irrigation, drainage and small-scale water programmes for 130 developing countries are as follows: (a) 15.2 million hectares of new irrigation development; (b) 12 million hectares of improvement/modernization of existing schemes; (c) 7 million hectares installed with drainage and water control facilities; and (d) 10 million hectares of small-scale water programmes and conservation" (para. 18.71)	"The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about $13.2 billion, including about $4.5 billion from the international community on grant or concessional terms" (para. 18.77)
Impacts of climate change on water resources	None	"The Conference secretariat has estimated the average total annual cost (1993-2000) of implementing the activities of this programme to be about $100 million, including about $40 million from the international community on grant or concessional terms" (para. 18.86)

18. Under programme area A (Integrated water resources development and management), the main targets by the year 2000 are: (a) to have designed and initiated costed and targeted national action programmes, (b) to have put in place appropriate institutional structures and legal instruments, and (c) to have established efficient water-use programmes to attain sustainable resource utilization patterns (para. 18.11 (a)).

19. Under programme area B (Water resources assessment), the main target by the year 2000 is to have studied in detail the feasibility of installing water resources assessment services (para. 18.26 (a)). As table 7 indicates, no specific targets are provided for complementary programme area G (Impacts of climate change on water resources).

20. Under programme area C (Protection of water resources, water quality and aquatic ecosystems), the main target by the year 2000 is to reduce the prevalence of water-associated diseases, starting with the eradication of dracunculiasis (guinea worm disease) and onchocerciasis (river blindness) (para. 18.39 (e)).

21. Although heads of State or Government, at the World Summit for Children, held in September 1990, called for both universal access to water-supply and to sanitation and eradication of guinea worm disease by 1995, according to what is stated under programme area D (Drinking-water supply and sanitation) of chapter 18 of Agenda 21, even for the more realistic target of achieving full coverage in water-supply by 2025, it is estimated that annual investments must reach double the current levels (para. 18.49).

22. Under programme area E (Water and sustainable urban development), the main targets by the year 2000 are (a) to have ensured that all urban residents have access to at least 40 litres per capita per day of safe water and that 75 per cent of the urban population are provided with on-site or community facilities for sanitation, (b) to have established and applied quantitative and qualitative discharge standards for municipal and industrial effluents, and (c) to have ensured that 75 per cent of solid waste generated in urban areas are collected and recycled or disposed of in an environmentally safe way (para. 18.58 (a), (b) and (c)).

23. According to what is stated under programme area F (Water for sustainable food production and rural development), Food and Agriculture Organization of the United Nations (FAO) global projections for irrigation, drainage and small-scale water programmes by the year 2000 for 130 developing countries are as follows: (a) 15.2 million hectares of new irrigation development, (b) 12 million hectares of improvement/modernization of existing schemes, (c) 7 million hectares installed with drainage and water control facilities, and (d) 10 million hectares of small-scale water programmes and conservation (para. 18.71).

Notes

1/ See Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992, vol. I. Resolutions Adopted by the Conference (A/CONF.151/26/Rev.1).